21-GP1-133 Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

Increased construction costs and decreased utility expenses. Achieve energy savings in gas fired hot water heated buildings while staying close to national code language.

ASHRAE published 90.1-2019 addendum bc implementing requirements for high capacity gas-fired hot water boiler systems to have condensing boilers. This language has been adapted to the WSEC with one modification being to delete renewable energy from the options of exception 1 due to the more main stream role renewables are playing in code.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

No independent cost calculation was done since this is language is vetted in national code. From 90.1 addendum bc:

First cost was determined from the 2012 GSA Condensing Boiler Study, which estimates $38.50/MBtu for noncondensing and $42.60/MBtu for condensing boilers. In addition, the study estimates an additional average annual maintenance cost of $400 for condensing boilers. Energy savings were found using energy modeling simulations run using USDOE's EnergyPlus. Three prototype buildings were used—large office, hospital, and secondary school—in various U.S. climate zones. A blended cost of $0.10/kWh was assumed.

Using the Standard 90.1 scalar ratio, the economic analysis shows an average scalar ratio of 4.2. The maximum scalar ratio of 17.2 for boilers with a life expectancy of 25 years. Models and estimates show that all prototypes fall within the maximum scalar ratio and are cost-effective.

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

No independent cost calculation was done since this is language is vetted in national code. From the addendum bc:

First cost was determined from the 2012 GSA Condensing Boiler Study, which estimates $38.50/MBtu for noncondensing and $42.60/MBtu for condensing boilers. In addition, the study estimates an additional average annual maintenance cost of $400 for condensing boilers. Energy savings were found using energy modeling simulations run using USDOE's EnergyPlus. Three prototype buildings were used—large office, hospital, and secondary school—in various U.S. climate zones. A blended cost of $0.10/kWh was assumed.

Using the Standard 90.1 scalar ratio, the economic analysis shows an average scalar ratio of 4.2. The maximum scalar ratio of 17.2 for boilers with a life expectancy of 25 years. Models and estimates show that all prototypes fall within the maximum scalar ratio and are cost-effective.

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

Small amount of time to review boiler system size and efficiency and design criteria used for coils. Since systems are generally central this effort will not be substantial.